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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/970,649	10/05/2001	Monica Jonsson	003300-833	2032

7590 12/28/2004

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EXAMINER	
HUI, SAN MING R	

ART UNIT	PAPER NUMBER
1617	

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/970,649	JONSSON ET AL.	
	Examiner	Art Unit	
	San-ming Hui	1617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37,60-75 and 77-89* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37,60-75 and 77-89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicant's amendments filed September 22, 2004 have been entered. The cancellation of claims 38-59 and 76 is acknowledged. The addition of claims 85-89 is acknowledged. Claims 1-37, 60-75, 77-89 are pending.

The outstanding rejection under 35 USC 112, second paragraph with regard to "reversibly solidified active substance" in claim 4 is withdrawn in view of the amendments filed September 22, 2004.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-37, 60-75, 77-89 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,616,949 ('949). Although the conflicting claims are not identical, they are not patentably distinct from each other because '949 teaches an almost exactly the same method of preparing microparticles. '949 teaches the instant method steps a)-h) with the different wordings of step b) reciting that the solution of step a) be concentrated

with solution of polyethylene glycol. '949 teaches the PEG employed can be with molecular weight 400-100,000kDa.

'949 does not expressly teach the instant concentration of PEG. '949 does not expressly teach the herein molecular weight of PEG. '949 does not expressly teach temperature of the mixing condition.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the herein claimed concentration and molecular weight of PEG into the method of '949. It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare the instant composition in the temperature as recited.

One of ordinary skill in the art would have been motivated to employ the herein claimed concentration and molecular weight of PEG into the method of '949. The optimization of result effect parameters (e.g., the concentration and molecular weight of PEG) is obvious as being within the skill of the artisan. Furthermore, one of ordinary skill in the art would have been motivated to prepare the instant composition in the temperature as recited since optimization of the result effect parameters, such as mixing conditions, would be within the purview of skilled artisan.

Claims 1-37, 60-75, 77-89 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,706,288 ('288). Although the conflicting claims are not identical, they are not patentably distinct from each other because '288 teaches an almost exactly the

same method of preparing microparticles with different order. '288 teaches the instant method steps of making the starch solution or suspension first and then combine with the solution of active substance. Afterwards, combining the resulting composition with PEG solution. '288 teaches the PEG employed can be with molecular weight 100-4,000kDa, and most prefer 300-600kDa. '288 teaches the combination steps were carried in temperature of 30-37°C.

'288 does not expressly teach the specific order of mixing the ingredients together.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the specific order of mixing the ingredients together.

One of ordinary skill in the art would have been motivated to employ specific order of mixing the ingredients together. Absent evidence to the contrary, simply mixing together the same ingredients in a different order would be obvious to one of ordinary skill in the art because adding A to B and mix would be considered the same as adding B to A and mix.

The double patenting rejection will be maintained since no terminal disclaimer or substantial amendments to the claimed subject matter have been filed. Applicant will consider filing one or more appropriate terminal disclaimers if the instant claims are in conditions for allowance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-37, 60-75, 77-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woiszwillo et al. (US Patent 5,981,719 from IDS received January 22, 2002), Ekman et al. (US Patent 4,822,535) in view of Laakso et al. (Journal of Pharmaceutical Sciences, 1986;75(10):962-967 from IDS received January 22, 2002)

and Takada et al. (US Patent 5,622,657 from IDS received January 22, 2002), references of record in previous office action mailed February 26, 2003.

Woiszwillo et al. teaches a method of preparing biological active microparticles suitable for parenteral administration by mixing an aqueous solution of bioactive compounds, such as insulin, leuprolide, and bovine Serum Albumin, with the solution of polyethylene glycol. The microparticles are collected after heating to temperature between 37 - 70°C, centrifuging and washing (See col. 21, line 11-34; also col. 5, line 65 - col.7, line 49). Woiszwillo et al. also teaches the biological active substances as enzymes, recombinant proteins, polypeptide, carbonhydrate, such as insulin, leuprolide, and Bovine Serum Albumin (See col. 7, line 50 – col. 8, line 32). Woiszwillo et al. also teaches the concentration of the polymer as between 5-50% (see col. 11, line 48). Woiszwillo et al. also teaches the solution of preferred polymers, including polyethylene glycol, having molecular weight of 3,000 to 500,000 daltons can be added to the solution of the macromolecules in order to form a microparticles (See col. 12, lines 33-42). Woiszwillo et al. also teaches the way to optimizing the microparticles by altering the particle size and temperature (See col. 13, lines 30-36).

Ekman et al. teaches a method to encapsulate bioactive substance in order to form a solid microparticles by employing a two-phase emulsion system (See abstract, also col. 9, line 13 – 26). Ekman et al. teaches the two-phase system suitable for the preparation of such microparticle as polyethylene glycol/soluble starch/water (See col. 2, line 11-12). Ekman et al. also teaches the drying steps may be accomplished by evaporation or ultrafiltration, in which evaporation would include heating or reduced

pressure (e.g., freeze-drying) (See col. 3, line 1-8). Ekman et al. also teaches the polyethylene glycol as preferred polymer and its molecular weight as 100-2,000,000 Da (See col. 4, line 36).

The references do not expressly teach the method of preparing microparticles by employing the method of Woiszwillo et al. followed by that of Ekman et al. The references do not expressly teach the herein claimed characteristics (i.e., nitrogen content, particle size, and amyloprectin content) of starch employed. The references do not expressly teach the optional steps recited in claims 35-37. The references do not expressly teach the herein claimed temperature employed. The references do not expressly teach the herein claimed concentrations and molecular weight of polyethylene glycol.

Laakso et al. teaches polyacryl starch is suitable as carrier for passive target drug delivery since polyacryl starch is rapidly taken up by the reticuloendothelial system (RES) (see the abstract). Laakso et al. also teaches the nitrogen content of polyacryl starch can be affected by the amount of initiator employed (See the abstract and figure 2 in page 964). Laakso et al. teaches the degradation of polyacryl starch can be affected by the amount of initiator employed and the degree of derivatization of the starch (See particularly the abstract and page 966-967, Discussion Section).

Takada et al. teaches a prolonged release biological active microparticles which is coated by copolymers of poyllactic/glycolic acid (See col. 7, line 15-53). Takada et al. teaches such sustained release formulation is useful for various peptides and hormones (See col. 3, line 28 – col. 4, line 34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare the herein claimed microparticles by employing the method of preparing microparticles by employing the method of Woiszwillo et al. followed by that of Ekman et al. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the suitable starch compounds herein claimed in the method of preparing the herein claimed microparticles. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the herein claimed temperature and particle size in the herein claimed method. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the herein claimed materials for preparing the optional sustained release shell for the microparticle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the herein claimed temperature as well as concentrations and molecular weight of polyethylene glycol in preparing the herein claimed microparticles.

One of ordinary skill in the art would have been motivated to prepare the herein claimed microparticles by employing the method of Woiszwillo et al. followed by that of Ekman et al. because Woiszwillo et al.'s method is to prepare a microparticle and then Ekman et al. would further encapsulate such microparticle to increasing the stability of the biological active substances.

One of ordinary skill in the art would have been motivated to employ the suitable starch compounds herein claimed in the method of preparing the herein claimed microparticles since the polyacryl starch is well-known as useful for passive targeting

drug delivery. Optimizing the nitrogen content, molecular weight, the starch solution concentration, the weight ratio between the biological active substance and starch, the temperature employed, and particle size would be considered obvious as being within the purview of skilled artisan.

One of ordinary skill in the art would have been motivated to employ the herein claimed materials for preparing the optional sustained release shell for the microparticle since such materials are well-known to be useful as sustained release material for peptide medicine. Employing the herein claimed polymer as sustained release shell would have been reasonably expected to be similarly useful.

One of ordinary skill in the art would have been motivated to employ the herein claimed temperature as well as concentrations and molecular weight of polyethylene glycol in preparing the herein claimed microparticles. Optimization is seen to be within the purview of the skilled artisan, absent evidence to the contrary.

Response to Arguments

Applicant's arguments filed September 22, 2004 averring Ekman not capable modifying the teachings of Woiszwillo in arriving the instant invention have been fully considered but they are not persuasive. Applicants' argues that Woiszwillo teaches a method of preparing micropaticle with single phase whereas Ekman teaches a method of preparing micropaticle with a two-phase system not being compatible. A two-phase or multi-pahse system is always involving in two or more immiscible systems. Using Woiszwillo's sytem as one of the immiscible system and apply it to Ekman's system

would seems to be reasonable and obvious. Moreover, the benefit of employing the method of Woiszwillo followed by that of Ekman would be the stability increase of the biological active substances. The microparticles prepared by Woiszwillo et al.'s method can be further encapsulated by Ekman et al.'s method. That is from a single phrase process moving to a two-phase process just as herein recited. Furthermore, there is no teaching away to discourage one of ordinary skill in the art to modify Woiszwillo's system to Ekman's system of preparing microparticles. Applicant's reasoning is apparently based on the fact that Ekman teaches a multiple phase emulsion wile Woiszwillo is teaching a single-phase system. Such arguments are not found persuasive as discussed above.

Applicant further argues that the Woiszwillo's system is a complete system that the cited prior art fails to provide motivation to further modify microparitcles, which are prepared by Woiszwillo's method, by coating with starch. Such arguments have been considered, but are not found persuasive. As the applicant realizd, Woiszwillo teaches that various materials can further stabilize the microparticles. Therefore, possessing the teachings of the cited prior art, one of ordinary skill in the art would have been motivated to further encapsulate the Woiszwillo's microparticles by starch using Ekman's method.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to San-ming Hui whose telephone number is (571) 272-0626. The examiner can normally be reached on Mon 9:00 to 1:00, Tu - Fri from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sreeni Padmanabhan, PhD., can be reached on (571) 272-0629. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

San-ming Hui
Primary Examiner
Art Unit 1617